



2050

## Heat Roadmap Europe

A low-carbon heating and cooling strategy

# 2015 Final Heating & Cooling Demand in Finland



Country presentation  
October 2017

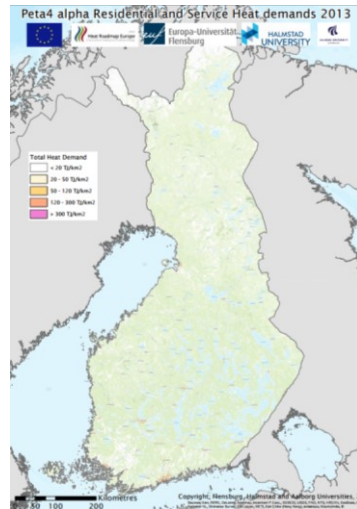
## Context of Finland





## General context

- **Population** <sup>[1]</sup>:
  - 5.5 million
    - 1.1% of EU28
- **GDP** <sup>[1]</sup>:
  - 205 billion EUR
    - 1.6% of EU28
- **Heating degree days** <sup>[2]</sup>:
  - 5 031 HDDs/year
    - The coldest of EU28

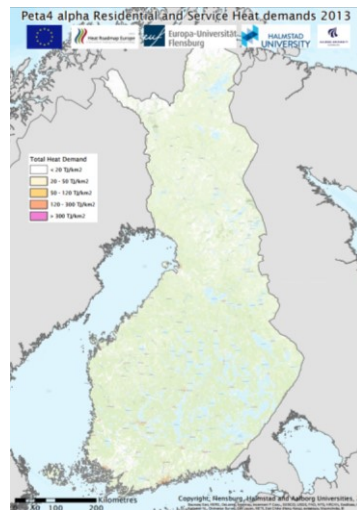


Heat Demand Atlas (major population centres are visible [HRE4, 2013])

1. DG Energy's 2014 data from the [Finland datasheet](#) (2016)  
 2. Eurostat's 2015 data on [HDDs](#) in in Finland (2016)

## General context – Energy intensity

- **Total final energy demand (FED)** <sup>[3]</sup>:
  - 281 TWh
    - 2.2% of EU28
    - 12<sup>th</sup> highest of EU28 and HRE14
- **FED per capita** :
  - 51.6 MWh/Capita
    - 2<sup>nd</sup> highest of EU28
    - Highest of HRE14
- **Final energy from renewable sources** <sup>[4]</sup>:
  - 110.5 TWh
    - 39.3% of total FED
    - 2<sup>nd</sup> highest share of EU28
    - 2<sup>nd</sup> highest share of HRE14
- **Final energy from renewable sources for H&C** <sup>[4]</sup>:
  - 89.7 TWh
    - 52.8% of the total H&C
    - 2<sup>nd</sup> highest share of EU28
    - 2<sup>nd</sup> highest share of HRE14



Heat Demand Atlas (major population centres are visible [HRE4, 2013])

3. Eurostat's 2015 data on [annual energy quantities](#) in Finland  
 4. Eurostat's RES [Shares 2015 results](#)





## Climate and emissions

- Finland has committed to a GHG emission decrease of 16% <sup>[5]</sup>, within the EU Climate and Energy Package

Carbon per capita [kg CO <sub>2</sub> /person]	Carbon per GDP [ton CO <sub>2</sub> /billion EUR]	Carbon Emission per tone of energy carrier (carbon intensity) [kg CO <sub>2</sub> /toe]
9,098	266	1,434
4 <sup>th</sup> highest among the 14 HRE	7 <sup>th</sup> highest among the 14 HRE	3 <sup>rd</sup> highest among the 14 HRE
2014 data <sup>[1]</sup>		

1. DG Energy's 2014 data from the [Finland datasheet](#) (2016)  
5. Official Journal of the European Union, [Decision No. 406](#) (2009)

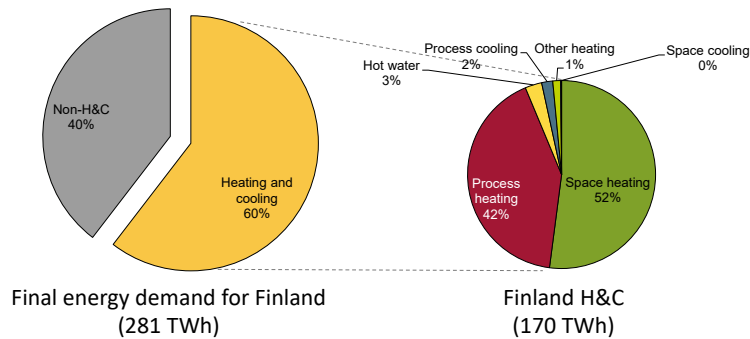
## Current national energy situation





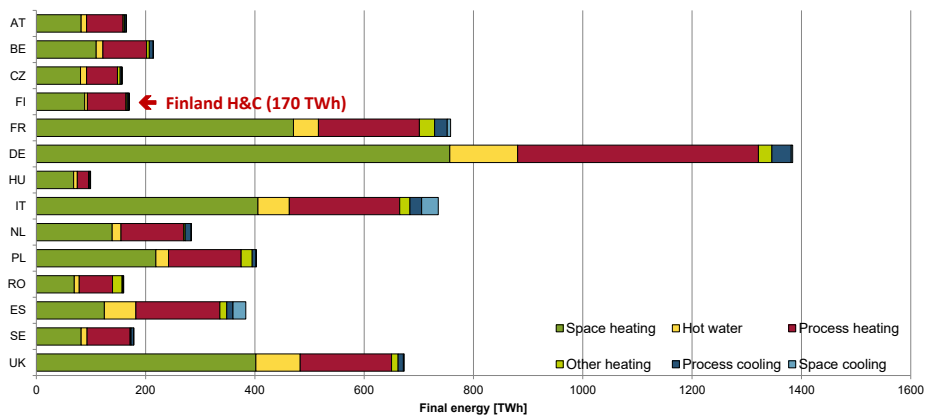
## Finland: H&C energy by purposes

- H&C comprises 60% of Finland's final energy demand.
- Space and water heating account for 55% of the total H&C need



## 14 HRE: H&C energy by purposes

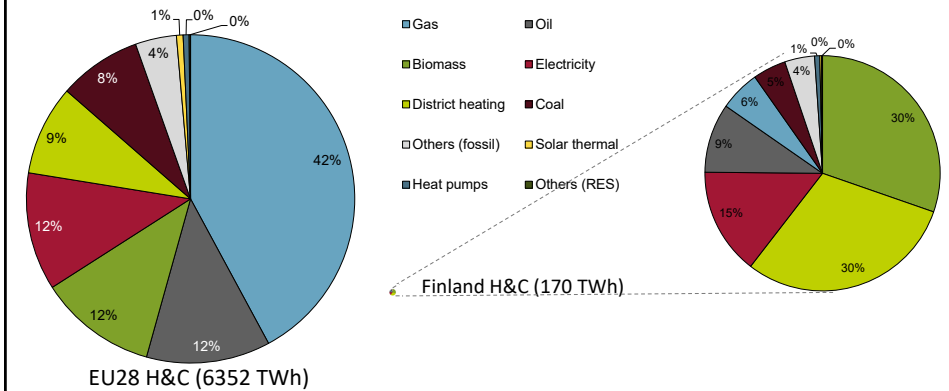
- Finland has the 5<sup>th</sup> lowest final energy demand for H&C among the 14 HRE countries.





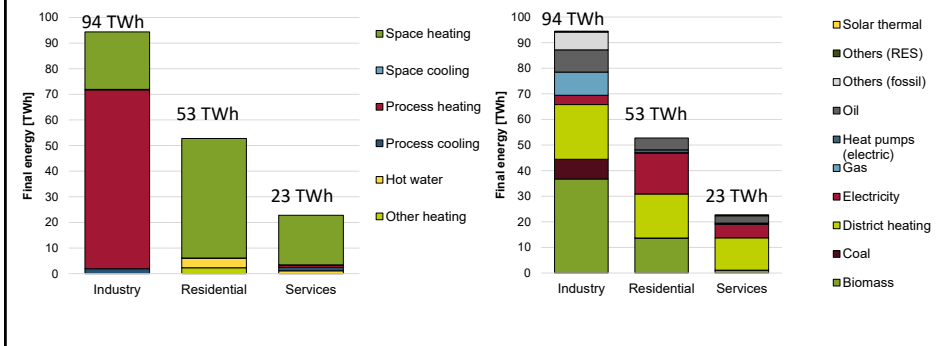
## H&C energy by energy carriers

- Finland accounts for 3% of the EU28's total delivered H&C demand.
- Compared to the EU28, Finland uses much more biomass, district heating and electricity, and way less fossil fuels.



## Sectors by purposes and energy carriers

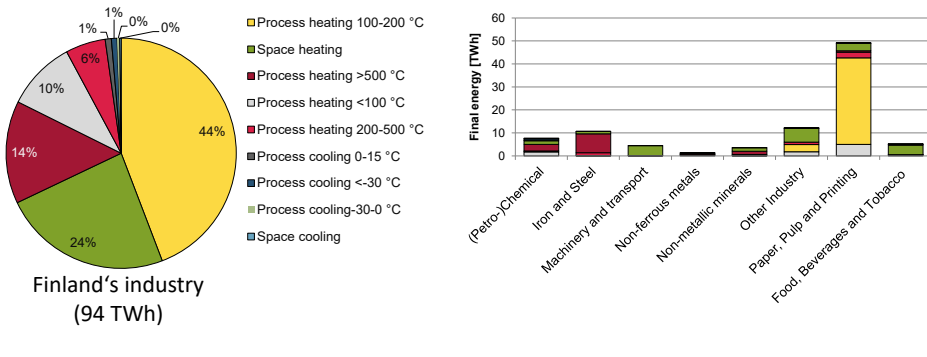
- Finland's industries are overwhelmingly dominated by process heating, other sectors by space heating.
- Finland's industry uses a wide range of energy sources.
- Households and service sector mainly use biomass, district heating and electricity.





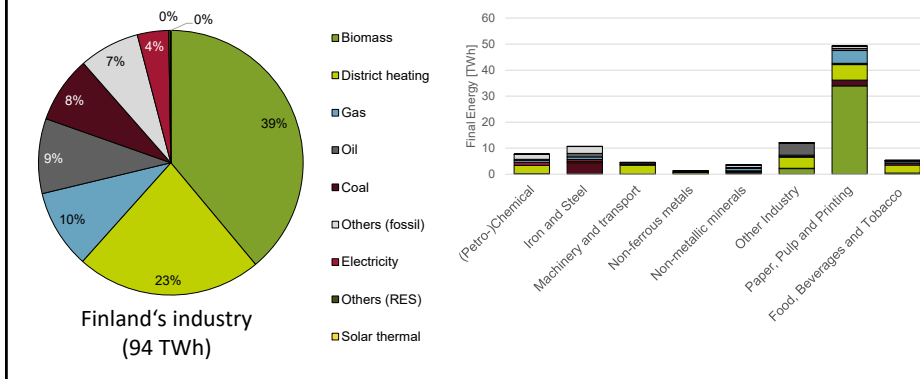
## Industry sub-sectors by H&C purposes

- Finland's industry uses mostly process heating of 100-200 °C and space heating.
- Most of the process heating is used for the 'paper, pulp and printing' sub-sector, while the space heating is divided among all sub-sectors



## Industry sub-sectors by energy carriers

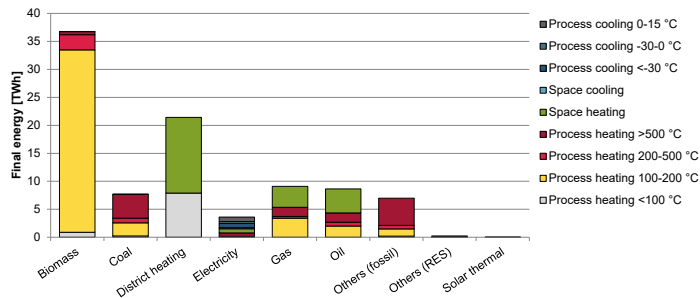
- To attain this heating, Finland's industry uses mostly biomass and district heating, and to a smaller extent fossil fuels.





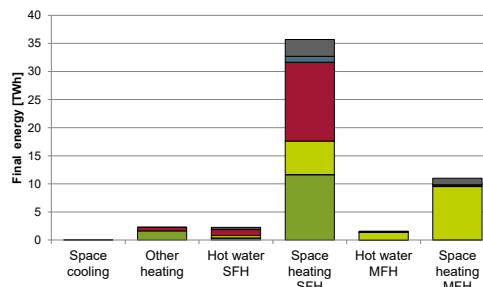
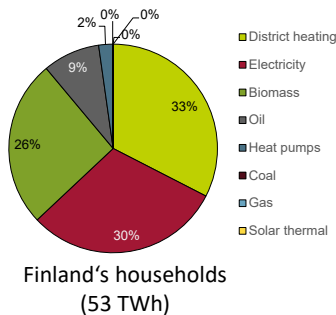
## Industry Space Heating

- Finnish Industry uses mainly district heating for space heating, although it uses some gas, oil and electricity too



## Residential sub-sectors by energy carriers

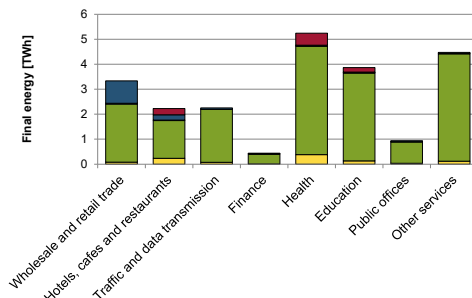
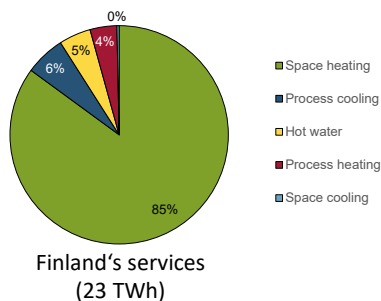
- Finnish households primarily district heating, electricity and biomass for heating
- Single-family homes are the only market for biomass heating.
- Multi-family houses are the main market for district heating





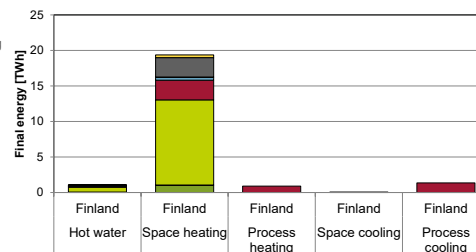
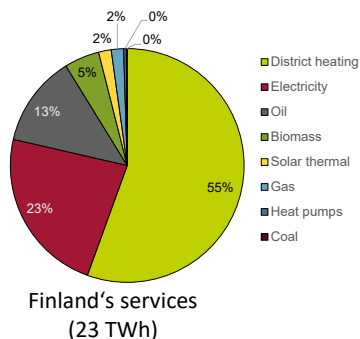
## Service sub-sectors by H&C purposes

- Space heating is definitely the main concern for Finland's service sector.
- Finland's service sector has very little demand for cooling. The only sub-sector using cooling are the 'wholesale and retail trade' and the 'hotels, cafes and restaurants' sub-sectors.



## Service sectors by energy carriers

- Finland's service sector uses mainly district heating, most of which goes to space heating.
- All cooling, and process heating, are powered by electricity only.

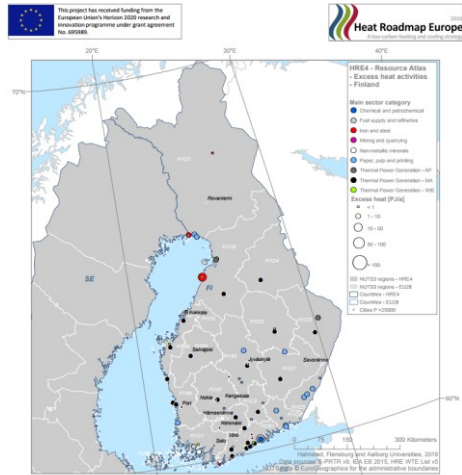






## Excess heat sources

- **Excess Heat:**  
At least 58 Twh\*
  - Would cover 62% of the final energy demand for Space heating and Hot water in Finland
- The biggest excess heat sources are concentrated in the South regions of the country.

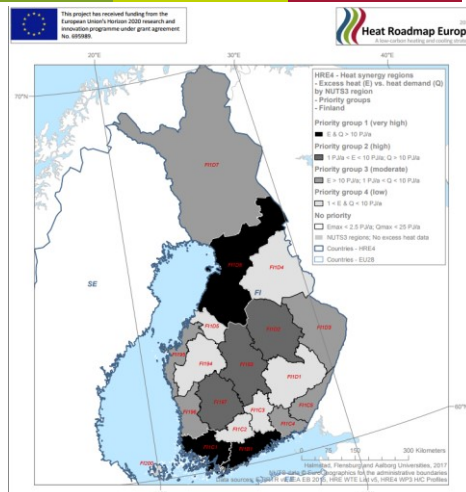


Excess Heat Atlas [HRE4, 2013]

\* Calculated from the 82 biggest facilities in Finland, using Peta 4.2

## Heat Synergy Regions

- There are 3 regions with very high potential for district heating
- 3 other regions present a high potential for district heating



Excess Heat Atlas [HRE4, 2013]





## Main references cited

---

1. DG Energy's 2014 data from the [Finland datasheet](#) (2016)
2. Eurostat's 2015 data on [HDDs](#) (2016)
3. Eurostat's 2015 data on [annual energy quantities](#)
4. Eurostat's RES [Shares 2015 results](#)
5. Official Journal of the European Union, [Decision No. 406](#) (2009)